

Section 7

AIR QUALITY

SECTION 7 AIR QUALITY

This section contains three components: 1.) tables showing the amount of volatile organic compound (VOC) emissions from construction equipment needed to build the proposed project; 2.) tables showing ambient air quality data collected at stations in Orleans and St. Bernard Parishes, Louisiana; and 3.) a table showing the National Ambient Air Quality Standards.

The following information will assist in understanding the tables on VOC emissions:

1. The tables were developed information contained in the cost estimates for the lock construction alternatives.
2. The tables show emissions from equipment that would be used for multiple construction contracts. The totals from the two tables must be added together to obtain the maximum total annual emission from project construction.
3. The first table lists equipment to be used for lock construction, levees, floodwalls, and channels. This work would occur over a 4-year period. To obtain an average annual amount of emissions, the total number of hours each type of equipment would be on site is divided by 4. The total hours on site is the number of work hours, which would be 8 to 10 hours for most types of equipment per work day.
4. The second table lists the equipment required for relocations and bridge work during any typical year of project construction.
5. The two tables are subdivided by equipment horsepower (hp). Diesel powered equipment with <600hp have a different emission factor than those with >600 hp.
6. The multiplying factor for time is necessary to compensate for equipment non-use during worker break and lunch time, equipment maintenance time, and non-use time. The 0.83 time factor is simply the assumption that, on average, equipment would be used about 50 minutes out of each work day hour.
7. The multiplying factor for hp is necessary because the equipment would be used at only a percentage of its rated horsepower. Emissions would be less than for equipment run at their full throttle rating.
8. Annual horsepower hours are obtained by multiplying the hours on site, times the hp, times the time factor, times the hp factor. The annual horsepower hours are multiplied by the emission factors to obtain tons of VOC emissions.

IHNC New Lock / VOC Emissions
Feature: Lock Structure, Levees, Floodwalls, and Channels
Project Year: 4-year period of intensive construction

Units	Equipment Item (Equipment <600hp)	Total Hours On Site 4-years	Hours/ Year On Site	Fuel Type		hp	Multiplying Factor		Annual hp hours
				Gas	Dsel		Time	% hp	
3	Manitowoc 4100	21,600	5,400		D	360	0.83	0.50	806,760
1	Pile Hammer/Compressor 2150cfm	3,600	900		D	456	0.83	0.65	221,411
1	S-90 Hydro Hammer	2,000	500		D	185	0.83	0.65	49,904
3	American 7225	10,800	2,700		D	213	0.83	0.50	238,667
3	Truck Crane, 45 ton	10,800	2,700		D	177	0.83	0.50	198,329
2	Air Compressor, 950cfm	14,400	3,600		D	260	0.83	0.65	504,972
1	Derrick Crane, 700 ton	1,000	250		D	500	0.83	0.50	51,875
3	Concrete Pump Truck	6,000	1,500		D	300	0.83	0.30	112,050
2	Hydraulic Excavator Cat 245	1,000	250		D	360	0.83	0.70	52,290
2	Hydraulic Excavator Cat 235	1,000	250		D	250	0.83	0.70	36,313
2	Dozer, Cat D-6	7,200	1,800		D	165	0.83	0.70	172,557
2	Dozer, Cat D-5	7,200	1,800		D	120	0.83	0.70	125,496
2	Dozer, Cat D-4	7,200	1,800		D	95	0.83	0.70	99,351
1	Motor Grader, Cat 12G	7,200	1,800		D	135	0.83	0.70	141,183
2	Front-end Loader, Cat 950	7,200	1,800		D	160	0.83	0.70	167,328
3	Tractor, JD 2355	5,400	1,350		D	65	0.83	0.70	50,983
12	Trucks, Dump	43,200	10,800		D	250	0.83	0.30	672,300
10	Trucks, Pickup	72,000	18,000	G		150	0.83	0.30	672,300
1	Asphalt Paver	1,000	250		D	120	0.83	0.70	17,430
1	Asphalt Distributor	1,000	250		D	50	0.83	0.70	7,263
1	Asphalt Sweeper	1,000	250		D	76	0.83	0.70	11,039
2	Asphalt Drum Roller	2,000	500		D	80	0.83	0.70	23,240
10	Concrete Trucks	7,000	1,750		D	200	0.83	0.30	87,150
2	Sheepsfoot Roller	1,000	250		D	210	0.83	0.70	30,503
6	Trucks, flatbed trailer	24,000	6,000		D	200	0.83	0.30	298,800
12	Generators, Misc. A	21,600	5,400		D	200	0.83	0.65	582,660
12	Generators, Misc. B	21,600	5,400	G		20	0.83	0.65	58,266
2	Draglines, Northwest 70	3,600	900		D	238	0.83	0.70	124,450
TOTAL GASOLINE (hp hours)									730,566
TOTAL DIESEL (hp hours)									4,884,301

Emission Factors	Gas	Diesel		
Exhaust	0.015	0.00247		
Evaporation	0.00066	0	Emissions	
Crankcase	0.00485	0.0000441	Tons (gas)	7.9
Refueling	0.00108	0	Tons (diesel)	6.1
Total	0.02159	0.0025141	Emissions Subtotal (Tons)	14.0

Units	Equipment Item (Equipment >600hp)	Total Hours On Site 4-years	Hours/ Year On Site	Fuel Type		hp	Multiplying Factor		Annual hp hours
				Gas	Dsel		Time	% hp	
3	Tugboats	12,960	3,240		D	2,000	0.83	0.70	3,764,880
2	Tugboats	17,280	4,320		D	1,200	0.83	0.70	3,011,904
4	Manitowoc 4600	14,400	3,600		D	685	0.83	0.50	1,023,390
1	Hydraulic Dredge & Plant	7,200	1,800		D	4,500	0.83	0.70	4,706,100
TOTAL DIESEL (hp hours)									12,506,274

Emission Factor from Table 3.4-2 0.000728

Emissions Subtotal (Tons) 4.6

Total (Tons) 18.6

**IHNC New Lock / VOC Emissions
Feature: Relocations and Bridges
Project Year: Any Typical Year**

Units	Equipment Item	Total Hours On Site	Fuel Type		hp	Multiplying Factor		Annual hp hours
			Gas	Dsel		Time	% hp	
1	Manitowoc 4100	3,600		D	360	0.83	0.50	537,840
2	American 7225	7,200		D	213	0.83	0.50	636,444
1	S-90 Hydro Hammer	3,600		D	185	0.83	0.65	359,307
10	Trucks, Misc	36,000		D	200	0.83	0.30	1,792,800
4	Asphalt Equipment	14,400		D	100	0.83	0.70	836,640
4	Hydraulic Excavator Cat 235	14,400		D	250	0.83	0.70	2,091,600
2	Air Compressor	7,200		D	260	0.83	0.65	1,009,944
10	Concrete Trucks	36,000		D	200	0.83	0.30	1,792,800
2	Dozer, Cat D-6	7,200		D	120	0.83	0.70	501,984
2	Dozer, Cat D-4	7,200		D	95	0.83	0.70	397,404
3	Loader/Backhoe JD 710	10,800		D	100	0.83	0.70	627,480
1	Truck Crane, 45 ton	3,600		D	177	0.83	0.50	264,438
2	Sheepsfoot Roller	7,200		D	210	0.83	0.70	878,472
5	Generators, Misc.	18,000	G		20	0.83	0.65	194,220
1	Front-end Loader, Cat 950	3,600		D	160	0.83	0.70	334,656
5	Trucks, Pickup	18,000	G		150	0.83	0.30	672,300
TOTAL GASOLINE (hp hours)								866,520
TOTAL DIESEL (hp hours)								12,061,809
Emission Factors		Gas	Diesel					
Exhaust		0.015	0.00247					
Evaporation		0.00066	0	Emissions				
Crankcase		0.00485	0.0000441	Tons (gas)				9.4
Refueling		0.00108	0	Tons (diesel)				15.2
Total		0.02159	0.0025141	Emission Subtotal (Tons)				24.5
Units	Equipment Item (Equipment >600hp)	Total Hours On Site	Fuel Type		hp	Multiplying Factor		Annual hp hours
			Gas	Dsel		Time	% hp	
1	Hydraulic Dredge & Plant	3,600		D	4,500	0.83	0.70	9,412,200
4	Manitowoc 4600	7,200		D	685	0.83	0.50	2,046,780
2	Tugboats	14,400		D	1,200	0.83	0.70	10,039,680
TOTAL DIESEL (hp hours)								21,498,660
Emission Factor from Table 3.4-2								0.000728
Emissions Subtotal (Tons)								7.8
Total (Tons)								32.3

AMBIENT AIR QUALITY DATA

Carbon Monoxide

Location: New Orleans City Park

Year	Max. ppm (1 hour)	2nd Max. ppm (1 hour)	Number of Values > Primary Standard	Max. ppm (8 hour)
1986	7.9	7.5	0	6.0
1987	9.1	9.0	0	6.9
1988	10.7	9.6	0	6.5
1989	9.3	8.4	0	6.9
1990	7.0	7.0	0	6.0
1991	6.0	6.0	0	4.3
1992	8.0	7.0	0	6.1
1993	16.0	8.0	0	6.1
1994	6.0	6.0	0	5.0
1995	5.0	4.0	0	3.3

Location: Tulane Medical Center (New Orleans)

1986	14.8	12.6	0	7.7
1987	14.6	10.7	0	8.1
1988	11.9	11.9	0	7.1
1989	15.8	12.8	0	7.9
1990	10.8	10.3	0	6.2
1991	8.6	8.5	0	4.4
1992	11.0	10.0	0	5.3
1993	11.0	11.0	0	5.1
1994	10.0	9.0	0	6.4
1995	10.0	8.0	0	4.3

Nitrogen Dioxide

Location: New Orleans City Park

Year	Max. ppm (1 hour)	Annual Mean ppm	Number of Times > Primary Standard
1986	0.102	0.025	0
1987	0.133	0.026	0
1988	0.097	0.024	0
1989	0.086	0.022	0
1990	0.086	0.020	0
1991	0.102	0.019	0
1992	0.088	0.023	0
1993	0.080	0.019	0
1994	0.085	0.020	0
1995	0.074	0.021	0

**AMBIENT AIR QUALITY DATA
(Continued)**

Ozone

Location: New Orleans City Park

Year	Highest Daily Max. ppm	2nd Highest Daily Max. ppm	Number Days > Standard	Number Hours > Standard
1986	0.117	0.103	0	0
1987	0.110	0.108	0	0
1988	0.110	0.108	0	0
1989	0.116	0.108	0	0
1990	0.101	0.095	0	0
1991	0.108	0.090	0	0
1992	0.104	0.093	0	0
1993	0.095	0.094	0	0
1994	0.124	0.104	0	0
1995	0.101	0.098	0	0

Location: Arabi, Louisiana (St. Bernard Parish)

1986	0.109	0.108	0	0
1987	0.109	0.108	0	0
1988	0.110	0.104	0	0
1989	0.095	0.091	0	0
1990	0.118	0.107	0	0
1991	0.109	0.099	0	0
1992	0.115	0.104	0	0
1993	0.124	0.110	0	0
1994	0.120	0.118	0	0
1995	0.095	0.093	0	0

Sulfur Dioxide

Location: Arabi (St. Bernard Parish)

Year	Max. ppm (1 hour)	Max. ppm (24 hour)	Annual Arithmetic Mean	Number of Times > Primary Standard
1986	0.085	0.032	0.004	0
1987	0.066	0.018	0.003	0
1988	0.115	0.021	0.003	0
1989	0.058	0.019	0.003	0
1990	0.092	0.015	0.003	0
1991	0.130	0.045	0.005	0
1992	0.108	0.043	0.005	0
1993	0.126	0.027	0.006	0
1994	0.206	0.036	0.008	0
1995	0.116	0.032	0.007	0

**AMBIENT AIR QUALITY DATA
(Continued)**

Total Suspended Particulate

Location: Mew Orleans Civil Courts Building

Year	Maximum ug/m ³ 24 hrs	2nd Maximum	Annual Geometric Mean
1986	90	82	45
1987	107	100	53
1988	86	80	47
1989	93	78	47
1990	68	66	39
1991	113	106	41
1992	130	89	41
1993	104	82	41
1994	80	76	76
1995	82	81	81

Location: New Orleans Water Treatment Plant

1986	176	154	58
1987	214	154	62
1988	105	99	49
1989	107	83	48
1990	112	90	45
1991	110	99	44
1992	137	105	47
1993	114	93	42
1994	94	90	48
1995	192	105	49

Particulate Matter 10 Micron

Location: New Orleans Water Purification Plant

Year	Maximum ug/m ³	2nd Max. ug/m ³	Annual Mean	Annual Mean > Std.
1986	74	66	34	No
1987	76	71	32	No
1988	57	47	37	No
1989	68	58	31	No
1990	75	54	27	No
1991	59	52	26	No
1992	72	52	27	No
1993	85	54	25	No
1994	53	50	25	No
1995	55	50	24	No

AMBIENT AIR QUALITY DATA
(Continued)

<u>Lead</u> Location: New Orleans Water Purification Plant				
Year	Qtr. #	Qtr. Max. ug/m	Qtr. Mean	Number of Values > Primary Standard
1986	1	0.10	0.09	0
	2	0.11	0.10	0
	3	0.17	0.13	0
	4	0.12	0.09	0
1987	1	0.10	0.09	0
	2	0.09	0.09	0
	3	0.10	0.09	0
	4	0.09	0.09	0
1988	1	0.09	0.09	0
	2	0.10	0.09	0
	3	0.10	0.10	0
	4	0.14	0.10	0
1989	1	0.10	0.09	0
	2	0.09	0.07	0
	3	0.05	0.03	0
	4	0.08	0.03	0
1990	1	0.04	0.02	0
	2	0.17	0.05	0
	3	0.03	0.02	0
	4	0.08	0.03	0
1991	1	0.04	0.02	0
	2	0.17	0.03	0
	3	0.03	0.02	0
	4	0.04	0.02	0
1992	1	0.20	0.03	0
	2	0.07	0.02	0
	3	0.05	0.03	0
	4	0.06	0.03	0
1993	1	0.03	0.02	0
	2	0.04	0.01	0
	3	0.03	0.02	0
	4	0.04	0.02	0

Location: New Orleans City Park (Established 3rd qtr. 1994)

1994	3	0.02	0.01
	4	0.04	0.02
1995	1	0.02	0.01
	2	0.11	0.03
	3	0.10	0.03
	4	0.04	0.02

LOUISIANA AMBIENT AIR QUALITY STANDARDS

POLLUTANT	PRIMARY STANDARD ¹	SECONDARY STANDARD ²
CARBON MONOXIDE		
Maximum 8 hr.	9 ppm	9 ppm
Maximum 1 hr.	35 ppm	
NITROGEN DIOXIDE		
Annual arithmetic mean	0.053 ppm or 100 ug/m ³	
OZONE		
Daily maximum 1 hr.	0.12 ppm or 235 ug/m ³	0.12 ppm or 235 ug/m ³
SULFUR DIOXIDE		
Maximum 24 hr.	0.14 ppm or 365 ug/m ³	
Maximum 3 hr.		0.50 ppm or 1300 ug/m ³
Annual arithmetic mean	0.03 ppm or 80 ug/m ³	
PARTICULATE MATTER 10 MICRON		
Maximum 24 hr.	150 ug/m ³	
Annual arithmetic mean	50 ug/m ³	
LEAD		
Maximum quarterly arithmetic mean	1.5 ug/m ³	

ug/m³ - micrograms per cubic meter
ppm - parts per million

¹ Primary ambient air quality standards define levels of air quality which the Administrator of the Environmental Protection Agency judges to be necessary, with an adequate margin of safety, to protect the public health.

² Secondary ambient air quality standards define levels of air quality which the administrator of the Environmental Protection Agency judges to be necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.